

# The Impact of Inflation, Investment, Population and FDI on Economic Growth through Supply Chain Performance in Pharmaceutical sector of Thailand

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## ABSTRACT

Many people worry that population growth will eventually cause an environmental catastrophe. However, the problem is bigger and more complex. The need to include environmental criteria in the analysis of supply chains is increasingly recognized as a result both of limitations that are posed by legislation and regulations as well as of various motivations that a company may have. Extensive literature is available on supply chain performance (SCP). Most of the studies examined the relationship between SCP and firm performance in both developed as well as developing countries. However, researchers did not consider the effect of SCP on economic growth, particularly in Thailand prospective. Therefore, the objective of this study is to examine the role of supply chain performance in the economic growth of Thailand. To address the objective, data are collected through questionnaires send by e-mail. 131 questionnaires are returned from 200 at response rate of 65.5%. Economic growth (EG) is used as dependent variable while SCP is used as mediating

variable. Inflation rate (IR) investment growth rate (IGR) population growth rate (PGR) and foreign direct investment (FDI) are used as independent variables. The findings show that SCP mediates the relationship between IR and EG, IGR and EG and PGR and EG. The study suggests that the Thai government must boost supply chain to enhance economic growth.

**Keywords:** Supply Chain Performance, Rate of Inflation, Investment Growth Rate, Population Growth Rate, Economic Growth Rate, Foreign Direct Investment.

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## INTRODUCTION

The world population is growing by approximately 74 million people annually and growth is not consistently distributed across the whole world. In 2019, the population of the people is higher than 7.7 billion people. From this more than 7 billion, 300 million people that require to be clothed, fed, kept warm and preferably, fostered and educated. Higher than 7.3 billion folks who, while busy utilizing means, also are creating large quantities of waste, and this number is still continue to raise. The international organization assessments reveal that the planet population will spread 9.2 billion by 2050. Many of us are in trouble that unbalanced growth will ultimately cause an environmental disaster. This can be an obvious anxiety, and a quick look at the unforeseen proof unquestionably shows that as our population has expanded, thus the well-being of our setting has declined [20]. The effect of various individuals on the world has brought about certain researchers be getting a substitution term to make clear our time—the Anthropocene age. Not at all like past geographical ages, where various topographical and atmosphere forms characterized the time spans, the proposed Anthropocene period is required the predominant impact people and their activities are having on the earth. Basically, people are substitution of worldwide geophysical power. The need to incorporate environmental criteria within the analysis of supply chains is increasingly recognized as a result both of limitations that are imposed by legislation and regulations similarly as of varied motivations that a corporation may have. A call model is proposed during this paper supported environmental performance indicators, which can support deciding within the case of supply chains within the presence of environmental echoes [19]. During the recent years, the provision chain is becoming the critical element in

economic process. As an honest supply chain mechanism has significant contribution among different nation's economy. Because it is a remarkable contribution to numerous country's GDP. Increase within the performance of producing companies and services companies [10] surges the development within the economy. The increase in firm performance have a right away relationship with economic process [6,7,8]. Mubarik [23] shows that low and steady inflation endorses economic process and contrariwise. On the opposite hand, some scholars show that there's a major adverse effect of inflation on growth for Latin American countries [12].

Investment plays a very important role in driving growth through increase in productivity levels. the connection between increment and economic process is debatable. Increment has been and can still be problematic as more people inevitably use more of the limited resources available, thereby reducing long-term possible growth [22]. Economic process is very important for raising living standards around the world and therefore the role of increment within the evolution of living standards could be a significant policy issue [15]. Foreign direct investment (FDI) brings technology and creates employment. It helps to adopt new methods of production and enhances productivity by bringing competition within the economy. FDI also introduces to novice management and organizational skills, and explores the new markets within the economy [18]. It eliminates the obstacles in adoption of technology and brings perfections within the quality of labor and capital inputs within the host economy. There is abundant of hypothetical and experimental writing that favors FDI as a device to support financial practices. FDI can go about as an apparatus to gather physical capital and move human money to the accepting nation, which has positive effect on economic growth rate. Innovation

transmission builds the skills underway components and this progressively lessens the mechanical hole among national and worldwide activities [2]. Similarly, FDI goes about as an asset move vehicle between two nations [7]. Along the indistinguishable line, Aghion and Howitt [1] showed that financial procedure is inspired by advancement. They contended that innovation comes into an economy primarily through FDI and international exchange. As increases in investment among various businesses increase the provision chain activities which ultimately increase the supply chain performance (SCP) [20]. Increases in SCP definitely have a positive sign of improved economic process. Moreover, changes in population also effect the provision of products and services. As both population and demand for goods have a relationship with one another [18, 19]. Logistics could be a noteworthy piece of a supply chain. Coordination the executives could be a lot of incorporated exercises to help the resulting angles including stock storing, material taking care of, cargo transport and information handling that are expected to move items through skilled store network process [21]. The idea of GSC was as of late created to deal with the ecological related components influencing fuel utilization [13] Logistics the executives is a significant piece of a production network. Client prerequisites propel firms to choose green inventory network the executives (GSCM) rehearses in their coordination tasks. The reception of GSCM practices and interest in cleaner advancements improve the ecological supportability as well as increment the organizations' efficiency for the significant stretch and assemble serious predominance [25].

There is little inquiry that nations are understanding the significance of green inventory management. Zhu et al. [28] directed research inside the setting of China, and their works clarify that Chinese associations keep battling to help their natural picture with cleaner creation and sustainable power source.

Therefore, the objective of this study is to examine the role of SCP in the economic growth of Thailand. The relationship between supply chain performance, inflation, investment, population, FDI and economic growth is shown in Figure 1.

## LITERATURE REVIEW

### Inflation and Economic Growth

There is an infinite survey of the literature, which contains theoretical and experimental parts of the connection between process and inflation. Now a days, the new class of models with relevancy inflation-economic growth linkage explains that connection between them is non-linear and, during this manner, there is a strength here. During this relationship between inflation and economic process, the availability chain has the foremost important role. Barro [4] provides evidence for a strongly significant negative effect of inflation on growth, Bruno and Easterly [8] show that the inflation-growth correlation is present only they base their cross-section regressions on annual observations, with the correlation weakening as longer-term time averages are used.

Jamal, and Wang [16] showed that both supply chain and inflation have an association with each other. Huyen [17] used the VAR model to appear at the connection between exchange rates and output and also checked the connection between exchange rates and inflation in Vietnam. The authors made some comments from the quantitative results like the foremost important component affecting gross domestic product (GDP) growth is itself and price instead of the rate of exchange. Gokal and Hanif [14] surveyed a few diverse financial theories to create agreement on the expansion and development relationship for the economy of Fiji. Their outcomes show that a feeble connection exists among expansion and development, while the adjustment in yield hole bears noteworthy bearing. The causality between the two factors ran single direction from GDP development to expansion. However, inflation features a negative effect on the supply chain. The negative effect on supply chain decreases the availability chain effectiveness.

*H<sub>1</sub>: Rate of inflation has negative effect on SCP.*

### Investment and Economic Growth

Moreover, the investment growth rate has a role in the supply chain and economic growth of the country. In general, to invest its mean to assign money within the anticipation of some profit within the future – as an example, investment in various goods, in land by the service industry, in several factories for manufacturing products, in product expansion, and in R&D. These investment activities growth have significant influence on supply chain and economic process. According to various studies, increase in investment increases economic process [7, 9]. It is evident from the literature that to expedite economic process investment is most vital. Increase in investment also have an influence on the supply chain. More the investment in the country more will be the supply chain performance. Most of the previous studies revealed that investment increases the business [10,11]. Therefore, there is a significant association between rate of investment growth, supply chain performance and economic growth.

*H<sub>2</sub>: Investment growth rate has positive effect on SCP.*

### Population and Economic Growth

Population growth rate features a considerable effect on economic process through supply chain performance. The relationship between population growth and growth of economic output has been studied extensively [15]. According to Bey [16], the population growth rate is responsible for the economic growth of every country. A study carried out by Peterson [18] on the relationship of population growth and economic growth drawing on historical data to chart the relations of population growth, growth in per capita, and complete economic growth by considering the past 200 years and found that both economic growth and population growth has a strong relationship with each other's. They also argued that the majority of the

previous studies have controversial leads to reference to the connection between economic process and increased rate. Peterson [8] studied the relationship of population growth and economic growth drawing on historical data and found that both economic growth and population growth has a strong relationship. Most of the previous studies have controversial results in respect to the connection between economic growth and population growth rate. Low populace growth in high-income nations is probably going to make social and economic issues while high populace growth in low-income nations may moderate their advancement. In the modern supply chain context, it is necessary to implement management practices that not only promote company and overall supply chain performance, but also focus on environmental, economic, and social concerns [5]. Some studies related to SCM address operational problems regarding suppliers, manufacturers, customers and the logistics network that delivers the products to the market [21]

A study administered by Hayaloğlu [22] found that logistic contributes towards economic process. Increase in logistic activities increases the availability chain and ultimately increases economic process. Most of the countries are now specialized in supply chain management activities to reinforce economic process. Increase in supply chain activities increase the contribution in the GDP. Thus, from the above discussion, it is concluded that population growth rate has the ability to influence supply chain performance. Increase or decrease in can influences the supply chain and finally supply chain performance can increase the economic growth

*H3: Population growth rate has a significant effect on SCP.*

*H4: SCP has a significant effect on economic growth.*

#### Foreign Direct Investment and Economic Growth

Enthusiasm for the nexus between financial development and FDI has expanded in current years of the deindustrialization of advanced nations and the

internationalization of production forms. Right now, FDI incorporates a few nations into the overall market [24]. The exact writing on the impact of financial procedure shows opposing outcomes. Right off the bat, there are a few examinations that show a constructive outcome of FDI on the degrees of creation through externalities and overflow impact. For instance, Barrell and Pain [3] proposed that FDI is a component for dispersing thoughts and advances among areas. This end is like that acquired by Borensztein et al., [7] who checked the impact of FDI on financial development in developing nations and showed that FDI goes about as a system of innovation move through expanded efficiency and acts just when the accepting nation meets an insignificant limit of load of human capital. Increase or decrease in FDI can influence the supply chain and finally supply chain performance modifies the economic growth.

*H5: FDI growth rate has a significant effect on SCP.*

Additionally, from the literature, it is investigated that inflation, investment rate of growth and FDI growth have a significant relationship with SCP. Moreover, SCP encompasses a significant relationship with economic process of the country. Therefore, by following the instructions of Baron and Kenny [9], supply chain performance is used as a mediating variable. Thus, from the mediation prospective of supply chain performance, following hypotheses are proposed;

*H6: SCP mediates the relationship between the rate of inflation and economic growth.*

*H7: SCP mediates the relationship between the investment growth rate and economic growth.*

*H8: SCP mediates the relationship between population growth rate and economic growth.*

*H9: SCP mediates the relationship between FDI growth rate and economic growth.*

#### Conceptual Framework

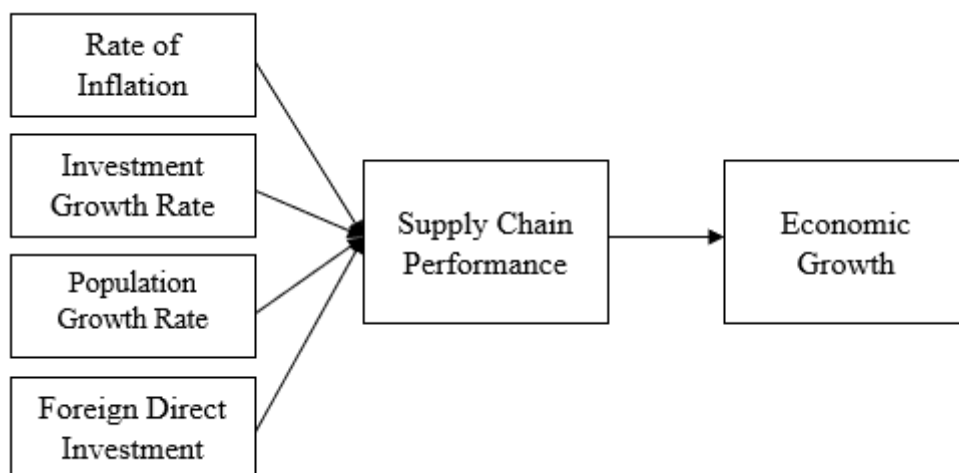


Figure 1: Conceptual Framework

## RESEARCH METHODOLOGY

Three categories of methodologies are directed within the extent of advanced education which are quantitative, qualitative and mixed method research techniques. Within the mixed methodology, quantitative furthermore as qualitative methods are employed [11]. Within the sociology research, the determination of method is most substantial. The methodologies segment should in line with the character of the research study being tried as opposition making choice hooked in to biases [27]. Along these lines, at the time of determination of the methodology for the research, numerous variables are considered yet the foremost critical thing to be considered is that the choice of technique which provides the most effective responses to the varied research questions.

Therefore, by following the above guidelines and examine the character of the study, the quantitative research design was selected. To deal with the target, data were collected from Thai pharmaceutical sector employees. E-mail survey was preferred to get data from Thailand pharmaceutical sector, and questionnaires were dispersed to assemble the information. Total 230 questionnaires accustomed to collect the information. All the questions within the questionnaires were close ended and supported the 5 options from strongly disagree to strongly agree. E mail addresses of respondents were gathered from the varied sources. Three reminders were sent to any or all the respondents who did not answer the survey. Additionally, all the measures were adapted from previous studies and measurement scale was developed to gather the information. From 230 questionnaires, only 131 valid responses were received. Therefore, PLS was accustomed to analyze the information, because PLS is suitable while examining the information with a little sample [15]. In this study economic growth through supply chain was used as dependent variable of study. Economic process is a rise within the assembly of economic goods and services, compared from one period of your time to a different. Four independent variables are used in the study. First is the rate of inflation (IR) that may be a quantitative measure of the speed at which the standard prices of a bundle of selected goods and services in an economy rises over a particular span of your time. It is the continual growth within the general level of costs where a unit of currency buys but it did in preceding periods. Often expressed as a percentage, inflation indicates a decrease within the purchasing power of a nation's currency. Second variable of study is investment rate of growth (IGR) which

represent the compounded annualized rate of growth of a company's revenues, earnings, dividends or perhaps macro concepts, like gross domestic product (GDP) and retail sales.

Third variable of study is the "population growth rate (PGR)"; the rate at which the number of persons during an inhabitant increases during a certain fundamental quantity, explained as a fraction of the initial population. Forth variable of study is FDI defined as an investment within the style of a controlling ownership during a business in one country by an entity based in another country. Supply chain performance is taken as mediating variable of study. Moreover, in order to analyze the impact, following econometric models are used:

$$EG = \beta_0 + \beta_1 IR + \epsilon \text{ ---- (1)}$$

$$SCP = \beta_0 + \beta_1 IR + \epsilon \text{ ---- (2)}$$

$$EG = \beta_0 + \beta_1 SCP + \epsilon \text{ ---- (3)}$$

$$EG = \beta_0 + \beta_1 IR + \beta_2 SCP + \epsilon \text{ ---- (4)}$$

$$EG = \beta_0 + \beta_1 IGR + \epsilon \text{ ---- (5)}$$

$$SCP = \beta_0 + \beta_1 IGR + \epsilon \text{ ---- (6)}$$

$$EG = \beta_0 + \beta_1 IGR + \beta_2 SCP + \epsilon \text{ ---- (7)}$$

$$EG = \beta_0 + \beta_1 PGR + \epsilon \text{ ---- (8)}$$

$$SCP = \beta_0 + \beta_1 PGR + \epsilon \text{ ---- (9)}$$

$$EG = \beta_0 + \beta_1 PGR + \beta_2 SCP + \epsilon \text{ ---- (10)}$$

$$EG = \beta_0 + \beta_1 FDI + \epsilon \text{ ---- (11)}$$

$$SCP = \beta_0 + \beta_1 FDI + \epsilon \text{ ---- (12)}$$

$$EG = \beta_0 + \beta_1 FDI + \beta_2 SCP + \epsilon \text{ ---- (13)}$$

Where; "EG: Economic Growth, SCP: Supply Chain Performance, IR: Inflation Rate, IGR: Investment Growth Rate, PGR: Population Growth Rate, FDI: Foreign Direct Investment,  $\beta_0$ : Constant and  $\beta_1$  and  $\beta_2$  are coefficients."

## EMPIRICAL RESULTS

Tables 1 shows the factor loading of data which shows that all the values are under satisfactory level. Factor loading is above 0.6 for all items, A pilot study is also conducted to examine the reliability of the data. The reliability analysis is shown in Table 2. Cronbach's Alpha ( $\alpha$ ) is used to assess the reliability of the instruments. All the factors have value of  $\alpha$  above 0.70 which enables the study to go for further analysis. Table 3 presents the "Pearson Correlation Matrix" for all the variables to check the multicollinearity in the data. The highest correlation coefficient (0.370) is in between IR and SCP stating that multicollinearity does not affect the data

TABLE 1: Factor Loadings

Items	EG	FDI	IGR	IR	PGR	SCP
EG1	0.697					
EG2	0.612					
EG3	0.792					
EG4	0.714					
EG5	0.657					
FDI1		0.552				
FDI2		0.636				
FDI3		0.617				
FDI4		0.609				

FDI5		0.663				
IGR1			0.602			
IGR2			0.654			
IGR3			0.685			
IGR4			0.622			
IGR5			0.603			
IR1				0.619		
IR2				0.569		
IR3				0.738		
IR4				0.762		
IR5				0.661		
PGR1					0.621	
PGR2					0.608	
PGR3					0.604	
PGR4					0.795	
PGR5					0.589	
SCP1						0.617
SCP2						0.664
SCP3						0.757
SCP4						0.952
SCP5						0.673

TABLE 2: Construct Reliability and Validity

	$\alpha$	rho_A	Composite Reliability	Average Variance Extracted (AVE)
EG	0.956	0.582	0.612	0.656
FDI	0.874	0.831	0.483	0.841
IGR	0.783	0.801	0.661	0.808
IR	0.893	0.775	0.807	0.557
PGR	0.774	0.626	0.619	0.621
SCP	0.768	0.823	0.867	0.715

TABLE 3: Correlation Analysis

	EG	FDI	IGR	IR	PGR	SCP
EG	1					
FDI	0.083	1				
IGR	0.256	0.129	1			
IR	0.245	0.031	0.169	1		
PGR	0.101	0.269	0.043	0.138	1	
SCP	0.273	0.178	0.207	0.370	0.201	1

TABLE 4: Path Analysis

Effects	Model (M)	Coefficient	P Values
Direct Effect			
<b>IR→EG</b>	M-1	0.261	0.000***
IR →SCP	M-2	-0.521	0.024**
SCP →EG	M-3	0.273	0.004***
<b>IGR→EG</b>	M-5	0.241	0.019***
IGR →SCP	M-6	0.138	0.003***
<b>PGR→EG</b>	M-8	0.198	0.014***
PGR →SCP	M-9	0.114	0.035**
<b>FDI→EG</b>	M-11	0.421	0.214
FDI →SCP	M-12	0.261	0.234
Indirect Effect			
IR→SCP→EG	M-4	0.243	0.021**

IGR→SCP→EG	M-7	0.037	0.024**
PGR→SCP→EG	M-10	0.084	0.035**

Table 4 shows the path analysis of study. From the result we can see IR shows significant (Coef. 0.261, Prob. 0.000) positive impact on EG at significance level of 1%. From (model 2) it is clear that IR show negative significant (Coef. 0.521, Prob. 0.024) association with SCP at significance level of 5%. Model 3 shows that SCP has significant (Coef. 0.273, Prob. 0.004) positive impact with EG at significance level of 1%. (Model 4) shows the significant (Coef. 0.236, Prob. 0.000) results between IR, SCP and EG at significance level of 1%. Which represents SCP has mediating role between IR and economic growth. IGR shows significant (Coef. 0.0241, Prob. 0.019) influence on EG at significance level of 1%. In Model 6, IGR has significant (Coef. 0.138, Prob. 0.003) impact on SCP at significance level of 1%. SCP shows significant (Coef. 0.037, Prob. 0.024) impact with IGR and EG at significance level of 5% (Model 7). Which shows that SCP has mediating role between IGR and EG. In model 8, PGR shows significant (Coef. 0.0198, Prob. 0.014) impact on EG at significance level of 1%. PGR has significant (Coef. 0.114, Prob. 0.035) impact on SCP at significance level of 1% (Model 9). In Model 10, PGR and SCP have significant (Coef. 0.084, Prob. 0.035) impact on EG. Which shows that SCP has mediating role with PGR and EG at significance level of 1%. In Model 11, FDI shows insignificant (Coef. 0.421, Prob. 0.214) impact on EG. Model 12 also shows that FDI has insignificant (Coef. 0.0216, Prob. 0.234) impact on SCP.

## DISCUSSION AND CONCLUSION

The theme of this study is to investigate the role of SCP in the economic growth of Thailand. The need to remember ecological criteria for the investigation of supply chains is progressively perceived, thus both of confinements that are acted by enactment and guidelines like well as of different inspirations that an organization may have. A choice model is proposed right now on natural execution pointers, which may bolster dynamic on account of supply chains within the sight of ecological contemplations. To address the objective and to get data from Thailand pharmaceutical sector, questionnaires were dispersed to assemble the information. Total 230 questionnaires accustomed to collect the information. All the questions within the questionnaires were close ended and supported the 5 options from strongly disagree to strongly agree. E mail addresses of respondents were gathered from the varied sources. From 230 questionnaires, only 131 valid responses were received. Economic growth through supply chain was used as dependent variable of study. Inflation rate, investment growth rate, population growth, and foreign direct investment were used as independent variable of study. Supply chain performance was used as mediating variable of study.

From the results we can see inflation rate shows the significant negative impact of SCP which supports H1 of Study. IGR shows the significant positive impact with SCP which supports H2 of Study. PGR has significant association

with SCP which supports the H3. SCP show significant positive association which EG which accepts H4 of study. FDI shows the insignificant impact on SCP which does not support H5. Moreover, SCP mediate the relationship between IR and EG, IGR and EG and PGR and EG which support our hypotheses 6, 7 and 8.

The Thai government must improve the SCP to increase economic growth. The Thai government should control inflation rate which will play important role for economic growth and increases the supply chain practices. Thus, the study is beneficial for practitioners to take help while making strategies.

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